

authority of that great man who was guided by a never-erring instinct of truth. I thought that the best I could do for his memory was to recall to the minds of the men, by the energy and intelligence of whom chemistry has undergone its modern astonishing development, what important treasures of knowledge lie still hidden in the works of that wonderful genius. I am not sufficiently acquainted with chemistry to be confident that I have given the right interpretation, that interpretation which Faraday himself would have given perhaps, if he had known the law of chemical quantivalence, if he had had the experimental means of ascertaining how large the extent, how unexceptional the accuracy of his law really is; and if he had known the precise formulation of the law of energy applied to chemical work, and of the laws which determine the distribution of electric forces in space as well as in ponderable bodies transmitting electric current or forming condensers. I shall consider my work of to-day well rewarded if I have succeeded in kindling anew the interest of chemists for the electro-chemical part of their science.

At the conclusion of the lecture Prof. Roscoe made the following remarks:—

"The pleasing duty now devolves upon me of proposing a vote of thanks to our distinguished friend for his interesting, suggestive, and most appropriate address.

"Prof. Helmholtz has shown us that Faraday's conception of electricity is in exact accordance with the most modern developments of this science. He has told us that although Faraday was unacquainted with the technical details of mathematics, all his conclusions are capable of the most exact mathematical expression, and that our great experimentalist possessed the spirit and thoughts characteristic of a truly mathematical mind. But our lecturer has gone further, for upon Faraday's well-known law of electrolysis he has founded a new electro-chemical theory, which reveals to us chemists, conclusions of the utmost importance. He tells us as the results of the application of the modern theory of electricity to Faraday's great experimental law, that the atom of every chemical element is always united with a definite unvarying quantity of electricity. Moreover—and this is most important—that this definite amount of electricity attached to each atom stands in close connection with the combining power of the atom which modern chemistry terms quantivalence. For if the amount of electricity belonging to the monad atom be taken as the unit, then that of the dyad atom is two, of the triad atom three, and so on.

"Hence then, thanks first to Faraday and now to Helmholtz, chemists have now a new and unlooked-for confirmation of one of their most important doctrines from the science of electricity.

"These, Ladies and Gentlemen, are indeed sufficient grounds for our claiming Prof. Helmholtz as a chemist, and justify me in requesting that he will allow his name to be placed on the list of Honorary Fellows of the Chemical Society.

"I have much pleasure in proposing a hearty vote of thanks to the Faraday Lecturer for the year."

This proposal was seconded by Prof. Tyndall.

#### NOTES

MR. CLARENCE KING has resigned his position as Director of the Geological Survey of the United States. It has long been no secret that he wished to retire from an appointment which confined him chiefly to executive functions, left him with practically no time for independent scientific work, and hampered him in those mining and other financial operations in which he is understood to have large investments. In a letter dated the 12th ult., addressed to the President of the United States, he says

that he believes he "can render more important service to science as an investigator than as the head of an executive bureau." All well-wishers to the cause of geology must hope that this belief will be fully justified; that the relief he obtains from official trammels will enable him once more to devote to geological research the energy and experience which have already borne such good fruit. His tenure of office in the Geological Survey has hardly been long enough to enable him fully to develop the plans he had sketched out for the vigorous prosecution of the Survey as a truly national undertaking, alike creditable to the scientific spirit of the Republic and important to the development of its industrial resources. But he will be held in honourable remembrance as the first head of the National Survey, and as having taken a leading share in its initial organisation. It is reported that Mr. J. W. Powell, so long and well known for his work in the Rio Colorado basin, is to be the new director.

A WISH having been expressed by certain members of the Torquay Natural History Society to have a portrait of Mr. William Pengelly, F.R.S., &c., and he having kindly consented to sit for the same, a committee has been formed for carrying the suggestion into effect. The portrait will, at Mr. Pengelly's request, be placed in the museum of the Society, Torquay. It was at first proposed to limit the list of subscribers to the members of the Torquay Natural History Society, but some members of the Devonshire Association, and other gentlemen, having expressed a wish to join in the work, it has been decided to make the contribution general. Subscriptions will be received by the hon. treasurer, Mr. Robert Kitson, Torquay Bank.

THE Royal Academy of Sciences of Turin gives notice that from January 1, 1879, the new term for competition for the third Bressa Prize has begun, to which, according to the testator's will, scientific men and inventors of all nations will be admitted. A prize will therefore be given to the scientific author or inventor, whatever be his nationality, who during the years 1879–1882, "according to the judgment of the Royal Academy of Sciences of Turin, shall have made the most important and useful discovery, or published the most valuable work on physical and experimental science, natural history, mathematics, chemistry, physiology and pathology, as well as geology, history, geography and statistics." The term will be closed at the end of December, 1882. The value of the prize amounts to 12,000 Italian lire. The prize will in no case be given to any of the national members of the Academy of Turin, resident or non-resident.

THE Literary and Philosophical Society of Manchester has recently completed the first century of its existence. Dr. Angus Smith is writing a history of the Society since its foundation, which will be read at an early meeting, and no doubt published in its *Proceedings*.

WE are glad to learn that the appeal on behalf of G. M. Smerdon, who has done such good work as foreman of the Kent Cavern explorations, has resulted in a sum sufficient to purchase him an annuity of 10*l*.

THE results of appointing a totally inexperienced and unknown man to the head of the Registrar-General's department, just before the taking of the census, are already beginning to be felt. Complaints of mismanagement are rife—whole streets in London not served with the census-papers, and in many cases those which were delivered have not yet been collected, and run some risk of being utilised for fire-lighting purposes. Certainly the interests of the country would have been best served by appointing Dr. Farr to the post of Registrar-General until at least the census work had been completed. Dr. Farr's long experience would have been of immense service, and these useful statistics would have been collected in something like scientific method.

THERE was a desultory talk on the subject of Technical Education in the House of Commons the other night, on the motion

of Mr. Anderson to appoint a roving Commission to inspect the technical schools of the Continent. The fact is, as Mr. Mundella pointed out, we know quite well what is wanted here, and if the City Guilds would only spend the amount of money they ought to do, there need be no want of technical instruction for all who are prepared to take advantage of it. As it is, such institutions as Owens College, the Mason College, and others are putting a first-rate scientific technical education within the reach of all classes, and what is really wanted is the teaching of elementary science in all our primary schools. The House was counted out over the motion.

A MEETING for the purpose of forming a society for the advancement of chemical industry was held on Monday afternoon at the rooms of the Chemical Society, Burlington House, Piccadilly, Prof. Roscoe presiding. The chairman explained that for some time the want of a Society had been felt, the object of which was the advancement of chemical industry in the United Kingdom. Its main purpose would be to bring together at stated intervals all those who possessed chemical, physical, and engineering knowledge, and who used this knowledge in the utilisation of chemical action on a manufacturing scale, and who had the charge of or an interest in chemical industries. It might afterwards prove desirable to found a distinct branch of the engineering profession, who might be designated as chemical engineers. He drew attention to the advantages which would doubtless accrue to the various branches of chemical industry by the establishment of such an organisation. Briefly stated, its objects would be to enable persons interested in chemical industries to meet, to correspond, and to interchange ideas respecting improvements in the various processes, to publish information relating thereto by means of a journal or otherwise, to acquire and dispose of property for such purposes, and to do all other things incidental or conducive to the objects aimed at. Prof. Roscoe concluded by moving that it was desirable to form such a society as that suggested. This was seconded by Mr. Perkin and carried. Formal resolutions were then passed with the view of carrying out the object thus agreed upon.

We take the following significant passage from a paper read by Sir George Campbell, K.C.S.I., M.P., late Lieutenant-Governor of Bengal, to the Society of Arts on March 25 last:—"Most of us who go to India know very little about agriculture of any kind; and of agriculture under the conditions of Indian soil and climate we know nothing whatever. The consequence has been that when we have attempted to show the natives how to improve their agriculture we have generally egregiously failed, and to use a native expression, our faces have been blackened. In this respect I am afraid we are not improving. The old-fashioned civil servant, if not so literary as the new class, and perhaps not much more agricultural, settled down more in the country and learned more of native agricultural habits and ways. Present administrators, I am afraid, know very little of any kind of agriculture, and it is much the same with the native public servant; formerly they knew nothing of English literature, but they knew a great deal of the country; now they are very highly educated, but do not know much more of agriculture than their European superiors."

THE post of Curator of the Herbarium of the Royal Botanic Gardens, Calcutta, has been filled up by the India Office by the appointment, on the nomination of the Director of the Royal Gardens, Kew, of Mr. L. J. K. Brace, of New Providence, Bahamas. Mr. Brace was educated at Christ's Hospital, and held a subordinate post in the colony. Having turned his attention to botany, he was employed by the late Governor, Mr. W. Robinson, to make a collection for Kew of the indigenous vegetation.

OF late years the cultivation of Liberian coffee (*Coffea Liberica*) has been energetically pushed in English coffee-growing colonies

and possessions. This has been due to two causes:—First, the cultivation of Arabian coffee (*Coffea Arabica*) has been severely crippled in the New World by the "white fly" (*Cemiosoma coffeellum*), and in the Old by the "leaf disease" (*Hemileia vastatrix*); secondly, Liberian coffee being a more tropical plant, grows well at a zone of altitude below that which Arabian coffee requires. The produce of the plantations of the new species is now coming into commerce. At present it does not find much favour apparently in England, but in America it is better appreciated. Recent sales at New York of Ceylon-grown Liberian coffee have realised 93s. per cwt., or 12s. above the current quotation for middling plantation coffee (Arabian) in the London market. This is a result of great importance for the West Indian Islands. Liberian coffee has been found in Dominica to possess a comparative immunity from the attacks of the white fly, the ravages of which had all but completely extinguished the coffee-cultivation of the island. Not merely therefore can West Indian coffee cultivation be revived with reasonable prospect of success, but there is the additional encouragement of a ready market easy of access in the United States.

THE death is announced, at the age of seventy-five, of Sir Philip de Malpas Grey Egerton. Sir Philip was an occasional contributor to our pages.

A STRONG shock of earthquake occurred on Sunday afternoon at Chio, which has caused terrible destruction. Many houses in the principal town and thirty villages in the island are said to have been destroyed, and 4000 persons killed. Fresh shocks of earthquake occurred on Monday, and the inhabitants were taking refuge on board the steamers in the harbour. The country around and the town Tsesme, on the mainland, suffered considerably, and shocks were also felt on Monday at Zante, Syra, Smyrna, Carosto, Euboea, and Tinos. The island of Chio, Scio, or Skio, for the name is thus variously spelt, is situated in the Ægean Sea, separated from the coast of Anatolia by a channel not more than seven miles wide where narrowest, and about fifty-three miles west of Smyrna.

SOME of our readers may be glad to learn that the French Association has resolved to curtail the number of scientific meetings in order to extend the time left for excursions and festivals. The programme includes two receptions by the Mayor of Algiers, one by the Governor-General, and a large Arabian *fête* called *Bita*, dancing and singing by native women, &c. Possibly the reported massacre of the Flatters Expedition may put a stop to these ultra-scientific festivities.

WE notice that the names of Drs. Gladstone and Tribe are down for a paper in the Physical and Chemical Section of the meeting of the French Association at Algiers, as also that of Mr. Rodwell.

AT the ordinary meeting of the Sanitary Institute, to be held at 9, Conduit Street, on Wednesday, April 13, at 8 p.m., the Chairman of Council, Dr. Richardson, F.R.S., will give a short address entitled, "Some Brief Suggestions on the Best Mode of dealing with Small Pox and other Infectious Diseases in the Metropolis and other large Towns," to be followed by a discussion.

MR. R. J. FRISWELL writes:—As the following novel "facts" have their origin in *Truth* there can, I presume, be no gainsaying of them. As they are entirely new and are published in a journal not so well known as a scientific paper as it ought to be, will you be good enough to give them a wider currency for the information of chemists. Their value needs no comment:—"The bomb with which the Emperor was killed appears to have been filled with nitro-glycerine, and it is unfortunate that this compound, like gun-cotton, is so easy to make. A certain amount of glycerine is taken, and to this



sulphuric and nitric acid are added. Glycerine has an affinity for water. A molecule of water is abstracted, and a molecule of nitrous acid takes its place. Nitro-glycerine may be put into the fire or it may be struck without any dangerous consequence. If however it be set on fire by a fulminant, there is an explosion. If, as stated, the Russian bombs were made of glass, there must have been small projections made in the glass shell when manufactured, filled with fulminating powder. The explosive character arises from this: Nitrogen is composed of molecules in pairs of atoms. Nitric acid contains only one atom in its molecules. Upon this atom being set free from its unstable combination in the glycerine, the two atoms of nitrogen rush together, producing a vast amount of energy of combination in the shape of heat. The gaseous products are thus heated, and an explosion takes place immediately."

A SCHOOL of Gardening and Practical Floriculture has been established at the Crystal Palace, under the superintendence of Mr. Edward Milner.

M. DAUDIGNY, electrical engineer in Paris, has sent to the Municipal Council a petition asking for authority to establish on the top of the Colonne de Juillet a large electric lamp fed by a magneto-electric machine of fifty horse-power. This enormous light is to be diffused by a large reflector of special construction.

A MOST successful experiment in theatre illumination was tried on March 30 and 31, at the Athenæum of the rue des Martyrs, Paris, with the Werdermann incandescent light. The peculiarity of it is that it can be graduated at will for scenic effects, either by introducing resistance coils or varying the velocity of the Gramme machine. These experiments were witnessed by several influential members of the Municipal Council, who on the following morning proposed an inquiry into the propriety of obliging all the theatrical managers to light their halls with electricity.

MR. F. W. PUTNAM sends us a paper on Pueblo Pottery, which he contributed to the February number of the *American Art Review*. There are some well-executed coloured illustrations of specimens of the pottery which show some little taste in colour and ornamentation.

We have had several replies to our inquiry concerning the late Dr. Thomas Dick's astronomical instruments. They seem to have been disposed of after his death, and only one small instrument can be definitely traced. None of the instruments seem to have been of much scientific value.

MR. JOHNSTON-LAVIS writes, under date March 29:—"Vesuvius is to-night again active, lava running down the north-western slope of the cone. Only the reflection is visible from Naples. On Sunday morning a slight shock, or more correctly subterranean thunder, was felt at Casamicciola, although those in the ruins at the moment only became aware of it by the palor of others present, whose whole attention is arrested by the faintest move or noise."

A SCIENCE Students' Association has been formed in Liverpool, which includes all departments of science in its programme; the president is Mr. A. Norman Tate.

THE system of compressed-air clocks, of the use and construction of which in Paris we gave an account some time ago, is likely to have a trial in London. A Bill has been introduced into Parliament for this purpose. The number of stations proposed for the metropolis is ten.

In the notice of the meeting of the Mathematical Society in NATURE, vol. xxiii, p. 379, Mr. Wooster Woodruff Beman's name was misspelt Benson.

LIEUT.-COL. H. COLLETT, of Meean Meer, North-West Punjab, has sent us a money-order for 3*l.* towards the John Duncan Fund. We also acknowledge receipt of 1*l.* from M. G. S.

THE additions to the Zoological Society's Gardens during the past week include a Two-Spotted Paradoxure (*Nandinia binotata*) from West Africa, presented by Mr. A. Wentworth Forbes; a Golden Sparrow (*Auripasser euchlorus*) from Abyssinia, presented by Mr. J. Abrahams; a Chukar Partridge (*Caccabis chukar*), a Grey Francolin (*Francolinus ponticerianus*) from India, presented by M. J. M. Cornely, C.M.Z.S.; two Indian Antelopes (*Antelope cervicapra* ♂♂) from India, deposited; two Ethiopian Wart Hogs (*Phacochoerus aethiopicus* ♂♀) from South-East Africa, a Dusky Parrot (*Pionus violaceus*) from Guiana, three Ceylonese Hanging Parrakeets (*Loriculus asiaticus* ♂♂♀) from Ceylon, a Yellow Troupial (*Xanthosoma flavus*) from Buenos Ayres, purchased; a Fork-tailed Jungle Fowl (*Gallus furcatus* ♂) from Java, on approval; two Four-horned Antelopes (*Tetracerus quadricornis* ♂♀), a Burrhel Wild Sheep (*Ovis burrhel* ♂) from India, a Javan Adjutant (*Leptoptilus javanicus*) from Java, a Rock-hopper Penguin (*Eudyptes chrysocome*) from the Falkland Islands, received in exchange.

### OUR ASTRONOMICAL COLUMN

THE VARIABLE STARS U CEPHEI AND U GEMINORUM.—We learn from Mr. Knott that Ceraski's short-period variable in Cepheus was at a minimum on March 29 at about 12h. 45m. G.M.T.; clouds prevented observations till 11h. 35m., when it had barely fallen to minimum; for two hours, 11h. 45m.—13h. 45m., the star's light was sensibly constant—about 9.4m. On April 3 Mr. Knott again obtained a pretty complete observation; the time of minimum, taking the middle of the phase, was 12h. 24m. G.M.T.; for nearly 2h. 30m., or from 11h. 10m. to 13h. 36m., the star remained about 9.4m. Guided by these and previous observations the following approximate times of minima are inferred, and it is to be hoped that the series may be well observed:—

h. m.				h. m.				h. m.			
April 8	...	12	4	April 23	...	11	2	May 8	...	9	59
13	...	11	43	28	...	10	41	13	...	9	39
18	...	11	22	May 3	...	10	20	18	...	9	18

This variable has been hitherto called T Cephei in this column, but Mr. Knott draws attention to the circumstance that Ceraski (*Astron. Nach.*, No. 2343) applied that designation last October to another variable discovered by him, the position of which by meridian observations at Moscow was found to be in R.A. 21h. 7m. 57.05s., Decl. + 68° 0' 8".4 for 1880.0, and we accordingly follow his suggestion that the short-period variable will be more properly termed U Cephei.

U Geminorum was observed by Mr. Knott at about the maximum, or about 9.3m., on April 2 and 3. Maxima of this very irregular variable star are by no means easy to catch. It precedes the principal component of  $\Sigma$  1153 by 1m. 26.5s., and is north of it 7' 31". Prof. Winnecke gave a series of comparison stars in *Astron. Nach.*, No. 1120. Argelander's position for 1855 is R.A. 7h. 46m. 29.88s.; Decl. + 22° 22' 41".5.

While writing upon variable stars we may mention that B.A.C. 4767 is probably to be included among them. It was estimated 4m. by D'Agelet on May 15, 1783; it is called 6m. by Lacaille, Lalande, and Piazzi, and was so estimated in Argelander's Zone, No. 301; but although rated 5.7 in the *Uranometria Argentina* it is not found in Heis's Atlas nor in the *Uranometria* of Argelander. Its place for the present year is in R.A. 14h. 18m. 1s., with south declination, 24° 15' 6".

THE COMET OF 1812.—Several years since, Mr. W. E. Plummer of the University Observatory, Oxford, after a new reduction of the observations made at Paris and Viviers, which we possess in their original form, found the period of revolution about 1½ years less than that given by Encke, so that it is quite possible that the comet may arrive again at perihelion within the present year. We have already mentioned that M. Schulhof of Paris is engaged upon a strict investigation of the elements of this comet, and has the intention of preparing extended ephemerides, in the same manner that he has done for several of the minor planets which had not been observed at several oppositions, but the sweeping lines for every fourth day throughout the year are given in Herr Mahn's ephemeris computed on the suggestion of Prof. Winnecke, which will be found in the *Vierteljahrsschrift der Astronomischen Gesellschaft*, 12 Jahrgang.